IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re patent application of:	Confirmation No.: 6545
LISA A. BUCKMAN	Examiner: Bello Agustin
Serial No.: 10/080,944	Group Art Unit: 2613
Filed: February 22, 2002	Atty. Docket No.: 10004353-1
For: STRUCTURE AND APPARATUS FOR A VERY SHORT HAUL, FREE SPACE, AND FIBER OPTIC INTERCONNECT AND DATA LINK	

SUPPLEMENTAL APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to the Notice of Non-Compliant Appeal Brief mailed on June 25, 2007, the appellants submit the following supplemental appeal brief. This supplemental appeal brief is identical to the previous appeal brief, except section 3 indicates that claim 11 has been cancelled.

This brief contains items under the following headings as required by 37 CFR §41.37 and MPEP §1206:

1. Real Party In Interest
2. Related Appeals, Interferences and Judicial Proceedings
3. Status of Claims
4. Status of Amendments
5. Summary of Claimed Subject Matter
6. Grounds of Rejection to be Reviewed on Appeal
7. Argument

Appendix A	Claims
Appendix B	Evidence
Appendix C	Related Proceedings

1. REAL PARTY IN INTEREST

The real party in interest is AVAGO TECHNOLOGIES FIBER IP (SINGAPORE) PTE. LTD., a Singapore corporation.

2. RELATED APPEALS AND INTERFERENCES

Appellant and the undersigned attorney are not aware of any other appeals or interferences which will directly affect or be directly affected by or having a bearing on the Board's decision in the pending appeal.

3. STATUS OF CLAIMS

Claims 1-10 and 12-21 are currently pending in the present application. The appellants are appealing the rejections of claims 1-9, and 14-20. See, Claims Appendix.

Claims 1-4, 8-9, 14-16, and 21 stand finally rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,857,042 issued to Robertson.

Claims 5-7 stand finally rejected under 35 U.S.C. §103(a) as being unpatentable over Robertson (U.S. 5,857,042) in view of Baney (U.S. 6,486,984).

Claims 10-12, 13, and 17-20 stand finally rejected under 35 U.S.C. §103(a) as being unpatentable over Robertson (U.S. 5,857,042) in view of Baney (U.S. 6,486,984) and Ciemiewcz (U.S. 6,695,493).

Claim 11 has been cancelled.

As stated above, the appellants are not appealing the rejection of claims 10, 12, 13 and 21.

4. STATUS OF AMENDMENTS

Appellant did not file an after final request for reconsideration under 37 C.F.R. §1.116 in response to a Final Office Action dated August 2, 2006. Thus, there are no outstanding amendment to any of claims.

5. SUMMARY OF THE CLAIMED SUBJECT MATTER

The invention as claimed is summarized below with reference numerals and references to the specification and drawings. The invention is broadly set forth in the language corresponding to independent claims 1, 14, and 17. Discussions about elements of the invention can be found at least in the locations in the specification and drawings cited in the claims below.

1. A two-dimensional free space optical link comprising:

an array (302) of tightly-coupled, multi-wavelength arrays of vertical cavity surface emitting lasers (VCSELs) (410), operating at predetermined wavelengths; [Figs. 3, 4, and 6; Page 9, lines 8-14 and lines 17-23; Page 10 line 21 to page 11, line 8]

collimating optics (408, 604) for collimating the optical signals emitted from each said multi-wavelength array of VCSELs (410) into a single uniform optical signal (306, 610); [Figs. 3, 4, and 6; Page 9, lines 17-21; Page 10 line 21 to page 11, line 8] and

an array (310) of tightly-coupled optical receiver arrays, each said receiver array being configured to receive the signals from one of said VCSEL arrays, wherein the wavelengths of the received signals generally match the wavelengths of the signals transmitted by said VCSEL arrays such that multiple optical wavelengths can be simultaneously communicated at high-speed from one of said VCSEL arrays to one of said receiver arrays across a very short haul channel [Figs. 3, 5, and 6; Page 10, lines 7-17; Page 11, lines 9-16].

14. A two-dimensional optical link comprising:

an array (302) of tightly-coupled, multi-wavelength arrays of vertical cavity surface emitting lasers (VCSELs) (410), transmitting signals at predetermined wavelengths; [Figs. 3 and 4; Page 9, lines 8-14 and lines 17-23; Page 10 line 21 to page 11, line 8]

collimating optics for collimating the optical signals emitted from each said multi-wavelength array of VCSELs into a single uniform optical signal; [Figs. 3, 4, and 6; Page 9, lines 17-21; Page 10 line 21 to page 11, line 8] and

an array (31) of tightly coupled optical receiver arrays, each said receiver array being configured to receive a signal from one of said VCSEL arrays, wherein the wavelengths of the signals received from said VCSEL arrays generally match the wavelengths of the signals transmitted by said VCSEL arrays such that multiple optical wavelengths can be simultaneously communicated at high-speed from said VCSEL arrays to said receiver arrays across a channel [Figs. 3, 5, and 6; Page 10, lines 7-17; Page 11, lines 9-16].

17. A method of creating a two-dimensional optical link, the method comprising:

assembling an array of tightly-coupled, multi-wavelength arrays of vertical cavity surface emitting lasers (VCSELs) (410), wherein the VCSEL emitters (410) in the array are arranged in a regular pattern and each VCSEL emitter in the array of tightly-coupled VCSELs is set for a different emissive wavelength; [Figs. 3, 4, and 6; Page 9, lines 8-14 and lines 17-23]

collimating the optical signals emitted from each said multi-wavelength array of VCELs into a single uniform optical signal; [Figs. 3 and 4; Page 9, lines 8-14 and lines 17-23; Page 10 line 21 to page 11, line 8]

fabricating an array (310) of tightly-coupled optical receiver arrays, wherein each receiver array comprises a plurality of optical filters and mating photodetector arrangements; [Figs. 3, 5, and 6; Page 10, lines 7-17; Page 11, lines 9-16] and

mounting the VCSEL emitter array and receiver array onto respective transmitter and receiver electronic circuits configured to receive the respective emitter and receiver arrays [Figs. 3, 5, and 6; Page 10, lines 7-17; Page 11, lines 9-22].

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellants appeal the final rejection of claims 1-4, 8-9, and 14-16, under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,857,042 issued to Robertson.

Appellants appeal the final rejection of claims 5-7 under 35 U.S.C. §103(a) as being unpatentable over Robertson (U.S. 5,857,042) in view of Baney (U.S. 6,486,984).

Appellants appeal the final rejection of claims 17-20 under 35 U.S.C. §103(a) as being unpatentable over Robertson (U.S. 5,857,042) in view of Baney (U.S. 6,486,984) and Ciemiewcz (U.S. 6,695,493).

7. ARGUMENT

I. Rejection of Claims 1-4, 8-9, 14-16, and 21 Under 35 U.S.C. §102(b)

The appellants note that they are not appealing the rejection of claim 21.

CLAIM 1

Claim 1 is reprinted as follows for convenience:

> A two-dimensional free space optical link comprising:
>
> an array of tightly-coupled, multi-wavelength arrays of vertical cavity surface emitting lasers (VCSELs), operating at predetermined wavelengths;
>
> collimating optics for collimating the optical signals emitted from each said multi-wavelength array of VCSELs into a single uniform optical signal; and
>
> an array of tightly-coupled optical receiver arrays, each said receiver array being configured to receive the signals from one of said VCSEL arrays, wherein the wavelengths of the received signals generally match the wavelengths of the signals transmitted by said VCSEL arrays such that multiple optical wavelengths

can be simultaneously communicated at high-speed from one of said VCSEL arrays to one of said receiver arrays across a very short haul channel.

Claim 1 recites an array of arrays of vertical cavity surface emitting lasers (VCSELs). In some embodiments of the application, the arrays of VCSELs consists of four individual VCSELs. See Fig. 4, wherein each VSCEL array includes four individual VCSELs (410). Collimating optics collimates signals from the array of individual VCSELs into a single uniform optical signal. Accordingly, each single uniform optical signal includes signals emitted by a plurality of VCSELs. In the embodiment of Fig. 4, each single uniform optical signal has signals from four VCSELs.

The optical link of claim 1 further recites an optical receiver array, which consists of arrays of receivers. One embodiment of such a receiver array is shown in Fig. 5. Like the VCSELs, the arrays of receivers of Fig. 5 consist of four receivers each.

According to the final office action, Robertson discloses the optical link of claim 1 in Fig. 11, wherein the single uniform optical signal is disclosed in Fig. 3. The appellants disagree with this conclusion of the final office action. Referring to Fig. 3 of Robertson, a plurality of individual emitters (16A-16D) are associated with individual collimating optics. For example, the emitter 16A is associated with lens 18A having an optical axis 20A. Likewise, emitter 16B is associated with lens 18B having an optical axis 20B. Accordingly, each emitter of Robertson transmits via a single collimated light path. There is no situation in Robertson wherein multiple emitters transmit via the same collimated optical signal as in claim 1. Thus, Robertson does not disclose "collimating optics for collimating the optical signals emitted from each said multi-wavelength array of VCSELs into a single uniform optical signal" as recited in claim 1.

Fig. 11 was also cited in the office action. Fig. 11 simply discloses a plurality of transmitters as shown in Fig. 3. More specifically, each transmitter of Fig. 11 is associated with one collimated optical path. Fig. 11 does not disclose "collimating optics for collimating the optical signals emitted from each said multi-wavelength array of VCSELs into a single uniform optical signal" as claimed in claim 1.

Based on the foregoing, Robertson does not disclose all the elements of claim 1 and cannot anticipate claim 1. Therefore, the appellants request reversal of the rejection.

CLAIMS 2-4, 8, AND 9

Solely for the purposes of this appeal, claims 2-4, 8, and 9 will stand or fall with claim 1.

CLAIM 14

Claim 14 is independent and is reprinted as follows for convenience:

> A two-dimensional optical link comprising:
>
> an array of tightly-coupled, multi-wavelength arrays of vertical cavity surface emitting lasers (VCSELs), transmitting signals at predetermined wavelengths;
>
> collimating optics for collimating the optical signals emitted from each said multi-wavelength array of VCSELs into a single uniform optical signal; and
>
> an array of tightly coupled optical receiver arrays, each said receiver array being configured to receive a signal from one of said VCSEL arrays, wherein the wavelengths of the signals received from said VCSEL arrays generally match the wavelengths of the signals transmitted by said VCSEL arrays such that multiple optical wavelengths can be simultaneously communicated at high-speed from said VCSEL arrays to said receiver arrays across a channel.

Claim 14 was rejected on the same grounds as claim 1. Thus, the appellants incorporate the rebuttal to the rejection of claim 1 into this rebuttal of the rejection of claim 14. Claim 14 includes an array of VCSEL arrays. Claim 14 also recites "collimating optics for collimating the optical signals emitted from each said multi-wavelength array of VCSELs into a single uniform

optical signal." Thus, each collimated optical signal includes several optical signals from different VCSELs.

As set forth in the rebuttal to the rejection of claim 1, Robertson discloses one collimating lens for each emitter. Accordingly, each collimated optical signal is associated with only one emitter. Claim 14, on the other hand, recites "collimating optics for collimating the optical signals emitted from each said multi-wavelength array of VCSELs into a single uniform optical signal." Thus, as with claim 1, Robertson does not disclose all the elements of claim 14 and cannot anticipate claim 14.

Based on the foregoing, the appellants request that the rejection of claim 14 be reversed.

CLAIMS 15 AND 16

Solely for the purposes of this appeal, claims 15 and 16 will stand or fall with claim 14.

II. Rejection of Claims 5-7 Under 35 U.S.C. §103(a)

Claims 5-7 will stand or fall with claim 1 solely for the purposes of this appeal.

III. Rejection of Claims 10-13 and 17-20 Under 35 U.S.C. §103(a)

The appellants note that claims 10, 12, and 13 are not being appealed.

CLAIM 17

Claim 17 is independent and is reprinted as follows for convenience:

> A method of creating a two-dimensional optical link, the method comprising:

assembling an array of tightly-coupled, multi-wavelength arrays of vertical cavity surface emitting lasers (VCSELs), wherein the VCSEL emitters in the array are arranged in a regular pattern and each VCSEL emitter in the array of tightly-coupled VCSELs is set for a different emissive wavelength;

collimating the optical signals emitted from each said multi-wavelength array of VCELs into a single uniform optical signal;

fabricating an array of tightly-coupled optical receiver arrays, wherein each receiver array comprises a plurality of optical filters and mating photodetector arrangements; and

mounting the VCSEL emitter array and receiver array onto respective transmitter and receiver electronic circuits configured to receive the respective emitter and receiver arrays.

As with claim 1, claim 17 discloses collimating optical signals. More specifically, claim 17 discloses "collimating the optical signals emitted from each said multi-wavelength array of VCELs into a single uniform optical signal."

The final office action relies on Robertson to disclose the collimating of the optical signals. As set forth above in the rebuttal to the rejection of claim 1, Robertson does not disclose collimating optical signals from a plurality of sources. Accordingly, Robertson cannot disclose "collimating the optical signals emitted from each said multi-wavelength array of VCELs into a single uniform optical signal" as recited in claim 17.

There is no indication that any of the other cited references disclose collimating optical signals as recited in claim 17. Therefore, the references, taken individually or in combination, do not disclose all the elements of claim 17.

Based on the foregoing, the references cannot render claim 17 obvious. The appellants request reversal of the rejection.

CLAIMS 18-20

Solely for the purposes of this appeal, claims 18-20 will stand or fall with claim 17.

The applicants respectfully submit that, for the reasons of fact and law set forth above, the appeal should be reinstated and the decision of the Examiner in finally rejecting Claims should be reversed.

Respectfully submitted,
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CLAIMS APPENDIX

1. (Original) A two-dimensional free space optical link comprising:

an array of tightly-coupled, multi-wavelength arrays of vertical cavity surface emitting lasers (VCSELs), operating at predetermined wavelengths;

collimating optics for collimating the optical signals emitted from each said multi-wavelength array of VCSELs into a single uniform optical signal; and

an array of tightly-coupled optical receiver arrays, each said receiver array being configured to receive the signals from one of said VCSEL arrays, wherein the wavelengths of the received signals generally match the wavelengths of the signals transmitted by said VCSEL arrays such that multiple optical wavelengths can be simultaneously communicated at high-speed from one of said VCSEL arrays to one of said receiver arrays across a very short haul channel.

2. (Original) The optical link recited in claim 1, wherein said VCSELs are selected from the group consisting of bottom-emitting VCSELs and top-emitting VCSELs.

3. (Original) The optical link recited in claim 1, wherein said VCSEL array is configured as a tightly-bound cluster of VCSELs.

4. (Original) The optical link recited in claim 3, wherein the emitting elements of each VCSEL in said cluster form a small group positioned at the focal point of said collimating optics.

5. (Original) The optical link recited in claim 1, wherein said tightly-coupled optical receiver array of the said receiver arrays comprise partitioned optical filters and mating photodetectors.

6. (Original) The optical link recited in claim 5, wherein said optical filters of each said optical receiver array further comprise multiple segments, each segment having an individual filter element designed to pass a transmitted optical signal with a specific wavelength range.

7. (Original) The optical link recited in claim 5, wherein said photodetectors of each said optical receiver array further comprise multiple segments, each segment having an individual photodetector element that converts the transmitted optical signal received from each said filter element to an electrical signal.

8. (Original) The optical link recited in claim 1, wherein said short haul channel is free space.

9. (Original) The optical link recited in claim 1, wherein said short haul channel is optical fibers.

14. (Original) A two-dimensional optical link comprising:

an array of tightly-coupled, multi-wavelength arrays of vertical cavity surface emitting lasers (VCSELs), transmitting signals at predetermined wavelengths;

collimating optics for collimating the optical signals emitted from each said multi-wavelength array of VCSELs into a single uniform optical signal; and

an array of tightly coupled optical receiver arrays, each said receiver array being configured to receive a signal from one of said VCSEL arrays, wherein the wavelengths of the signals received from said VCSEL arrays generally match the wavelengths of the signals transmitted by said VCSEL arrays such that multiple optical wavelengths can be simultaneously communicated at high-speed from said VCSEL arrays to said receiver arrays across a channel.

15. (Original) The optical link recited in claim 14, wherein the signals from said VCSEL arrays are transmitted across the channel, to said receiver arrays through free space.

16. (Original) The optical link recited in claim 14, wherein the signals from said VCSEL arrays are transmitted across the channel to said receiver arrays through optical fibers.

17. (Previously presented) A method of creating a two-dimensional optical link, the method comprising:

assembling an array of tightly-coupled, multi-wavelength arrays of vertical cavity surface emitting lasers (VCSELs), wherein the VCSEL emitters in the array are arranged in a regular pattern and each VCSEL emitter in the array of tightly-coupled VCSELs is set for a different emissive wavelength;

collimating the optical signals emitted from each said multi-wavelength array of VCELs into a single uniform optical signal;

fabricating an array of tightly-coupled optical receiver arrays, wherein each receiver array comprises a plurality of optical filters and mating photodetector arrangements; and

mounting the VCSEL emitter array and receiver array onto respective transmitter and receiver electronic circuits configured to receive the respective emitter and receiver arrays.

18. (Previously presented) The method recited in claim 17, wherein each optical filter and photodetector arrangement has a plurality of segments, each segment having an individual filter and a mating photodector element where each filter is configured to pass one wavelength and each photodetector converts a specific optical signal with a specified wavelength to an electrical signal.

19. (Previously presented) The method recited in claim 17, and further comprising transmitting signals from the emitter array to the receiver array through free space.

20. (Previously presented) The method recited in claim 17, and further comprising transmitting signals from the emitter array to the receiver array through optical fibers.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.